combustion devices and related dispensing facilities such as the proposed natural gas fueling station and natural gas pressure regulating station. If fuel storage tanks were installed on the site, there may be emissions associated with the tanks, depending on the volume and type of fuel stored. Consistent with State of Colorado regulations, the NREL ES&H staff would evaluate emissions associated with new emissions sources prior to their installation. The greatest aggregate amount of actual emissions currently generated at the site is 2.42 TPY of NOx, primarily in association with the operation of Hybrid Power Test Beds. This quantity of NOx emissions does not approach the 100-TPY threshold amount for Major Source designation. Emissions resulting from the sources associated with the implementation of the Proposed Action would contribute an amount that would not significantly increase the amount of pollutants that currently exist in the ambient air. The use of HAPS and related emissions are not expected to increase substantially or approach any threshold quantities that would trigger new regulatory requirements.

4.3.3 Impacts of the No Action Alternative

If the Proposed Action were not implemented, incremental air quality impacts of the Proposed Action would not occur. Existing emissions from on-site operations would remain at current levels.

MITIGATION MEASURES

There are no significant impacts; therefore no mitigation measures are required under NEPA.

4.4 NOISE

The purpose of the noise analysis in this EA is to estimate and characterize construction and operational impacts resulting from the Proposed Action and the No Action Alternative. Detailed predictive noise modeling to precisely define future noise levels was not considered necessary.

Compliance with OSHA requirements for noise exposure is a site mandate, so anticipated impacts on NWTC staff would be minimized and mitigated.

4.4.1 Impacts from Construction Noise

The Proposed Action would result in construction noise from heavy equipment operation, building of foundations and structures, earthwork, and trenching and utility installation. Construction would be phased resulting in associated noise that would be generated intermittently and typically during daylight hours.

Construction operations could generate temporary noise levels up to 95 dBA measured at a reference level of 50 feet from the source (NRC, 2000). These maximum construction-related noise levels would be reduced to approximately 63 dBA at the nearest residence due to reduction of noise intensity with distance. Typical average traffic noise from adjacent roadways and industrial sites would be of roughly the same magnitude, thereby masking the construction noise at off-site locations.

Construction-related noise levels are expected to be approximately 58 dBA at the nearest trailhead. This noise level is equivalent to hearing normal conversation. However, average traffic noise originating from Highways 93 and 128 is likely to be greater than 58 dBA.

Therefore, noise resulting solely from construction activities is not expected to be annoying or even discernable at nearby receptors.

Table 4-1 displays the reduction in noise intensity associated with a 95-dB construction-related source over increasing distances. This table does not consider additional factors that contribute to the reduction of noise intensity, such as topography, weather conditions, and noise sources external to the NWTC (such as traffic noise).

Table 4-1. Reduction of Sound Level Intensity of a 95-dB (Construction-Related) Source as a Function of Receptor Distance

distance feet (meters)	dB
50 (15.5)	95
100 (30.3)	89
200 (60.6)	83
400 (121.2)	77
800 (242.4)	71
1600 (484.8)	65
3200 (969.6)	59
6400 (1939.2)	53

Noise levels associated with increased vehicle traffic resulting from construction activities would be temporary and limited to the times when construction actually takes place. Large trucks and other vehicles associated with the aggregate mining facilities and RFETS frequently use Highways 93 and 128 for access. Temporary increases in noise associated with construction traffic would produce a minor and inconsequential impact at nearby receptors.

4.4.2 Impacts from Operational Noise

Noise from various combinations of operating turbines will contribute to ambient noise levels on the NWTC site and make a minor contribution to off-site noise levels. Given substantial technology improvements, the primary sources of noise from the turbines would be from wind passing by rotor blades and mechanical noise from rotating turbine housings. Incremental noise generated by the operation of additional turbines would depend upon the total number of turbines being operated at a particular time, the relative locations of the turbines in relation to each other and to the nearest receptors, the types of turbines in operation, and meteorological conditions at the time. Noise produced by intense and simultaneous use of the site by turbines combines logarithmically.

The noise level that can be expected on the NWTC site from the simultaneous operation of turbines of various sizes turbines could decrease if newer (quieter) turbines dominate the test pad area, or could increase if smaller, older or otherwise noisier turbines dominate the test pad area. It has been assumed that the turbines could generate 90 dB measured at 100 feet from the test pad site (NWTC, Johnson, 2001).

Table 4-2 displays the reduction in noise intensity associated with a 90-dB source over increasing distances. This table does not consider additional factors that contribute to the reduction of noise intensity, such as topography, weather conditions, and noise sources external to the NWTC (such as traffic noise).

Table 4-2. Reduction of Sound Level Intensity of a 90-dB Source (Operations) as a Function of Receptor Distance

distance feet (meters	DB
100(30.3)	90
200 (60.6)	84
400 (121.2)	78
800 (242.2)	72
1600 (484.8)	66
3200 (969.6)	60
6400 (1939.2)	54

The estimated noise resulting solely from these assumed turbine operation conditions would be as follows:

- Nearest residence: approximately 64 dB, or slightly greater than that of normal conversation.
- Flatirons Vista Trailhead: approximately 57 dB, slightly less than the noise level of a normal conversation.
- Green Belt Plateau Trailhead: 58.5 dB, slightly less than the noise level of a normal conversation.

This incremental contribution would still be insignificant relative to far higher existing highway noise levels and would be inaudible under most circumstances.

Outdoor maintenance, rearranging equipment and the use of machines, equipment and tools in the test site area would temporarily and incrementally increase noise generated from turbine operations. Assuming that the noise created by these operations is equivalent to that generated during construction, this incremental impact would generate noise levels that would be considered insignificant at off-site locations.

Incremental impacts at off-site receptors from vehicle trips associated with adding new employees to the site would be inconsequential relative to existing highway vehicle use and anticipated increases associated with regional development and roadway linkages (see Section 3.2).

The relationship between noise and wildlife is discussed in Section 4.8.4.

4.4.3 Impacts of the No Action Alternative

No “new” noise sources would be added to the NWTC site if the No Action Alternative were implemented. Off-site noise levels in the area would continue to be dominated by vehicle traffic and aggregate operations.

MITIGATION MEASURES

There are no significant impacts; therefore no mitigation measures are required under NEPA.